

L 3885-66

ACCESSION NR: AT5025232

3

From the output slit of the monochromator, the light falls on the input of a photomultiplier. The output signals from the photomultiplier are fed through a balanced d-c amplifier to a K4-51 optical recorder. The monochromator in this instrument is modified by replacing the wavelength drum with a rotating conchoidal cam. In a single revolution, this cam moves a lever which rotates the prism so that the entire spectrum of the oxygen-cesium cathode passes through the output slit of the monochromator in 16 seconds. The prism is reset to its original position in 1 second. The cam is rotated by an MS-160 motor through a gear reducer. Wavelength markers are superimposed on the spectrogram for analysis of the spectral recordings. The upper passband limit of the system is more than five times the upper frequency necessary for reproducing a signal with small distortions. On the other hand, the time constant of the system is great enough to eliminate the need for a focusing system in front of the monochromator slit. Thus there is no angular error of measurement and the angular brightness distribution of the reference specimen (baryte paper) can be studied directly. Measurement errors under actual operating conditions do not exceed 1.5-2%. Orig. art. has: 6 figures.

ASSOCIATION: Glavnaya geofizicheskaya observatoriya (Main Geophysical Observatory)

SUBMITTED: 00

ENCL: 01

SUB CODE: 00

NO REF SOV: 002

OTHER: 000

Card 2/3

L 3885-66

ACCESSION NR: AT5025232

ENCLOSURE: 01

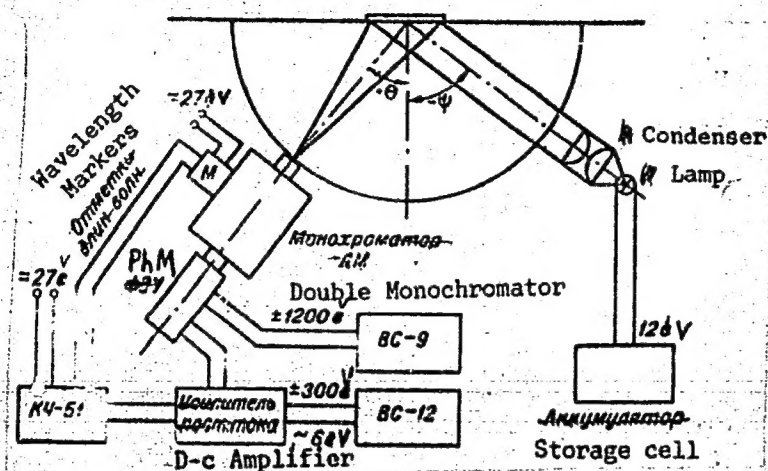


Fig. 1. Schematic diagram of the installation

BYK
Card 3/3

L 40282-66 ENT(1)/FCC IJP(c) GG/WW/GH

ACC NR: AR6014562

SOURCE CODE: UR/0169/65/000/011/B034/B034

AUTHORS: Kasatkina, O. I.; Shifrin, K. S.

42
B

TITLE: On the problem of the indicatrix of ^Nlight scattering by a system of spherical particles

SOURCE: Ref. zh. Geofizika, Abs. 11B250

REF SOURCE: Tr. Gl. geofiz. observ., vyp. 170, 1965, 105-114

TOPIC TAGS: light scattering, atmospheric cloud, fog, light diffraction, light interference, geometric optics

ABSTRACT: The problem of the possibility of obtaining indicatrices of light scattering in systems of spherical particles--particularly in clouds and fogs--is examined. The existing data necessary for calculating these indicatrices are evaluated. Calculations by the authors of indicatrices of light scattering by an individual particle with $m = 1.335$ for values of ρ equal to 59, 60, and 61 are given. The calculations were made by the formulas of geometric optics, taking into account diffraction and interference in the range of scattering angles from zero to 25° every 0.5° . It is concluded that the data necessary for calculation of the indicatrices of light scattering in systems of particles can be obtained only experimentally. Authors' abstract /Translation of abstract/

SUB CODE: 04, 20

Card 1/1772P

UDC: 551.521.3

5(2)

SCV/32-25-1-19/51

AUTHORS:

Rabovskiy, G. V., Yegorova, T. N., Kasatkina, O. P.

TITLE:

Rapid Method of Determining Sulfur Dioxide in Hydrogen Fluoride
(Bystryy metod opredeleniya dvuckisi sery vo ftoristom
vodorode)

PERIODICAL:

Zavodskaya Laboratoriya, 1959, Vol 25, Nr 1 pp 36-38 (USSR)

ABSTRACT:

As the iodometric method does not allow an accurate measurement of SO_2 in gaseous HF, a determination in a bicarbonate medium is proposed in the present case. By the reaction of HF with the bicarbonate an equal volume of CO_2 is formed and in a reaction of one SO_2 mole with iodine in a bicarbonate medium, four moles CO_2 are formed. The CO_2 volume can be determined with sufficient accuracy and so can the content of SO_2 . It is assumed that the errors caused by a dissolution of CO_2 in the bicarbonate solution are rather small under the conditions given. Experiments in an absorption vessel (Fig) (with stirrer and Hg seal) were carried out to confirm this. The experimental results obtained (Table 1) showed that the above mentioned

Card 1/2

SOV/32-25-1-19/51

Rapid Method of Determining Sulfur Dioxide in Hydrogen Fluoride

error does relatively not exceed $\pm 3\%$. An analysis step as well as the results obtained therefrom (Tables 2,3) are mentioned. The method allows determinations of 0.01% by weight of SO_2 and more, with an analysis taking from 10 to 15 minutes, and the relative error is mentioned to be 5-10%. There are 1 figure and 3 tables.

Card 2/2

L 2670-66 EWT(1)/EWT(m)/FGG/ENA(h) GS/GW
ACCESSION NR: AT5023943

UR/C000/65/000/000/0293/0306

AUTHOR: Dmitriyeva, G. V.; Kasatkina, V. I.

TITLE: Aerosynoptic conditions for the appearance on the earth's surface of areas of increased concentrations of stratospheric radioactive products

SOURCE: Nauchnaya konferentsiya po yadernoy meteorologii. Obninsk, 1964. Radioaktivnyye izotopy v atmosfere i ikh' ispol'zovaniye v meteorologii (Radioactive isotopes in the atmosphere and their use in meteorology); doklady konferentsii. Moscow, Atomizdat, 1965, 293-306

TOPIC TAGS: nuclear meteorology, radioactive pollution, radioactive fallout

ABSTRACT: This paper describes the methods used by the authors to identify the characteristics of various synoptic situations present in the surface boundary layer of the atmosphere over regions which have exhibited especially high radioactivity after thermonuclear explosions, and to identify the mechanisms by which radioactive air passes from the stratosphere into the surface boundary layer. The data used in these studies were collected from approximately 50 stations in the United States during the IGY. Orig. art. has: 8 figures and 2 tables. [ER]

Card 1/2

L 2670-66
ACCESSION NR: AT5023943

ASSOCIATION: none

SUBMITTED: 28Apr65

ENCL: 00

0
SUB CODE: ES, NP

NO REF SOV: 004

OTHER: 012

ATD PRESS: 4101

Card 2/2

CHOLAKOV, Iordan, dots, inzh. khim.; KASATKINA, Volia

Some problems in the prospective steel production in Bulgaria, and the problem of its raw material base. Tekhnika Bulg 13 no. 3:4-7,11 '64.

1. Member of the Board of Editors, "Tekhnika" (for Cholakov).

KASATKINA, Yelena

Our review of technological developments. Tekh.mol. 29 no.5:26
'61. (MIRA 14:5)

(Technological innovations)

KASATKINA-TITOVA, V.V., assistant

Blood transfusion into the bone marrow in obstetrics and *gynecology*.
Akush. i gig. 33 no.2:24-27 Mr-Apr '56. (MLRA 9:7)

1. Iz kafedry akusherstva i ginekologii (zav.-dotsent N.T.Rayevskaya)
Tashkentskogo instituta usovershenstvovaniya vrachey.

(BLOOD TRANSFUSION, in various dis.

gyn. dis. & labor)

(LABOR

blood transfusion is)

(GYNECOLOGICAL DISEASES

same)

USSR/Human and Animal Physiology- (Normal and Pathological).
Blood Circulation. Blood Pressure. Hypertension.

T

Abs Jour : Ref Zhur Biol., No 4, 1959, 17497

Author : Kasatkina-Titova, V.V.

Inst : -

Title : Ovarial-Menstrual Function in Hypertensive Patients.

Orig Pub : Med. zh. Uzbekistana, 1957, No 1, 36-38

Abstract : No abstract.

Card 1/1

- 48 -

KASATKINA, Yelena

Review of new developments. Tekh.mol. 29 no.2:26 '61.
(MIRA 14:3)

1. Korrespondent zhurnala "Tekhnika molodezhi."
(Technological innovations)

KASATKINA, Yelena

Our review of new developments. Tekh.mol. 29 no.3:39 '61.
(MIRA 14:3)

1. Korrespondent zhurnala "Tekhnika molodezhi."
(Technological innovations)

KASATKINA, Yelena

Our review of technological developments. Tekh.mol. 29
no.10:39 '61. (MIRA 14:10)

1. Korrespondent zhurnala "Tekhnika molodezhi".
(Technology)

PASKHALIS, T.K.; SIVOV, V.A.; RODIONOV, S.Ye.; KOSTINA, S.I.; KASATKINA,
Ya.I.

Preparation of soft butadiene-nitrile rubbers. Kauch.i rez. 19
no.9:1-4 S '60. (MIRA 13:10)

1. Yaroslavskiy zavod sinteticheskogo kauchuka.
(Rubbers, Synthetic)

ARONOVICH, Kh.A.; KASATKINA, Ye.I.; SEMENOV, V.N.

Attachment for a fractionation column. Zav.lab. 30 no.12:1520 '64.
(MIRA 18:1)

1. Yaroslavskiy zavod sinteticheskogo kauchuka.

GLOZMAN, O.S.; KASATKINOVA, A.P.

Some theoretical and clinical problems in blood replacement.
Bratisl. lek. listy 2 no.9:536-541 '63.

1. Katedra patofyziologie Kazasskeho lekarskeho institutu v Alma
Ate, Kaz., SSR.; veduci: prof. O.S.Glozman, Dr.Sc.

*

KASATOCHKIN, A.V., gornyy inzh.

Experience in diamond drilling of blast holes abroad. Gor. Zhur.
no.4: 35-37 Ap '60. (MIRA 14:6)

1. Moskovskiy gornyy institut.
(Boring)

KASATOCHKIN, Anatoliy Vasil'yevich; LYUBIMOV, N.G., otv. red. izd-
va; OVSEYENKO, V.G., tekhn. red.; BOLLYREVA, Z.A., tekhn.
red.

[Diamond drilling of blast holes] Almaznoe burenie vzryv-
nykh skvazhin. Moskva, Gosgortekhnizdat, 1962. 67 p.
(MIRA 15:7)

(Boring)

KUTUZOV, B.N., kand.tekhn.nauk; KASATCCHKIN, A.V., inzh.; MAKAREVICH, D.M.,
inzh., TOZAR', M.G., inzh.

Dust collection during boring with the cleaning of bore holes
with compressed air. Bezop.truda v prom. 5 no.11:23-24 II '61.
(MIRA 14:11)

1. Kafedra bur.vzryvnykh rabot Moskovskogo gornogo instituta.
(Mine dusts--Safety measures)

SHISHOVA, O.A.; OGURTSOVA, L.A.; KASATOCHKIN, V.I.

Kinetics of the absorption of amino acid in the intestines. Fiziol.
zhur. 47 no.5:630-637 My '61. (MIRA 14:5)

1. From the Laboratory of Higher Nervous Activity Institute of
Nutrition and the Department of Physical and Colloidal Chemistry,
I.M.Sechenov Medical Institute, Moscow.
(INTESTINES) (AMINO ACIDS)

1ST AND 2ND SERIES

3RD AND 4TH SERIES

COMMON ELEMENTS

COMMON VARIABLES INDEX

CA

2

X-ray investigations on the molecular structure of carnosine. O. Shikama and V. Kuznetsov. *Biochimica* 10, 136-8 (1946).—Presenting diagrams of carnosine, with unfiltered Cu-K radiation, the dimension of the mol. of carnosine in the direction of the length of the crystal appears to be 7.43 Å. H. Priestley

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

E-2-078-10000

CA

11A

Reversibility of thermal denaturation of protein under pressure. V. S. Tongur and V. I. Kasatoghkin (Moscow Pharm. Inst.). *Doklady Akad. Nauk S.S.S.R.* 74, 531-3 (1950).—Cryst. human blood albumin (1%) in phosphate buffer at pH 8 was heated in rubber sacs in a high-pressure autoclave 1 hr. Controls were run in the same app. without pressure. With pressure of 1000-7000 atm. at 20°, 70.5°, and 78.4°, the following was found: at pressures above 1000 atm. the equil. shifts toward natural protein (measured by turbidity of solns.); at pressures above 5000 atm. the protein is denatured by pressure and turbidity rapidly rises. Initial pressure needed for denaturation rises with increased temp. (results given graphically). The calcd. equil. concns. of denatured protein, calcd. as a function of pressure, agreed well with exptl. data. The following values for ΔF , ΔH , and ΔS , for the reaction were calcd.: at 293°K. and 1000 atm. 1633 kcal./mole, 24,000, and 76.3 kcal./mole/degree, resp.; at 2000 atm. and 343.5°K. -1133, 23814, and 73.0, resp.; at 2500 atm. and 343.5°K. -457, 24050, and 71.2, resp.

G. M. Kosolapoff

CA

12

Application of x-ray analysis to the study of milk products.
R. P. Alekseeva and V. I. Kasatchkin (Moscow Pharm
Inst.) *Izv. Akad. Nauk SSSR*, No. 13, 2224
(1951). Lactose can exist in the α -hydrate form crystg.
below 43.5° and the β -anhydride form crystallizing above
43.5°. Since the crystn. and the size of the crystals deter-
mine the quality of condensed milk, quant. detn. of α - and
 β -lactose is important and can be obtained by x-ray analysis.

It is also shown that a sample of powd. milk contained 28%
 β - and 72% α -form. Powd. and degreased milk and con-
densed milk contained only α -lactose. S. Pakover

TONGUR, V.S.; KASATOCHKIN, V.I.

Effect of high pressures on thermal denaturation of proteins. Khim. i Fiz.-
Khim. Vysokomolekul. Soedineniy, Doklady 7-oy Konf. Vysokomolekul. Soedineniyam,
'52, 124-30. (MLRA 5:7)
(GA 47 no.22:12438 '53)

KASATECHKIN, V. I.

U.S.S.R.

Protein regeneration under pressure. The kinetics and thermodynamics of the process. V. S. Tongur and V. I. Kasatechkin (Acad. Med. Sci. U.S.S.R., Moscow). *Trudy Vsesoyuz. Nauch. Tsentra Fizyologii, Biokhimiya i Farmakologiya, Akad. Nauk S.S.S.R.* 2, 168-76 (1954).—A new method was developed for the regeneration of denatured proteins with the aid of high pressure. On the basis of the general concept of heat denaturation as a structural disorganization of the protein mol. resulting in an increased molar vol., it was assumed that pressure would prevent heat denaturation and revert the process to that of regeneration of the protein mol. Under study were cryst. egg and human-serum albumin, conalbumin, γ -globulin, cryst. chymotrypsin, and insulin. The methods of study used were similar to those described by Tongur (C.A. 44, 170). Preliminary expts. (C.A. 47, 643A) with egg albumin verified the correctness of the theoretical assumption, and indicated that the non-cryst. fractions were primarily the ones that regenerated under pressure. However, such protein heated at 62° for 8 min. and subjected to pressure of 2000 atm. for 20 hrs. resulted in a regenerated protein that, in the properties studied, differed from both the native and the denatured protein, probably owing to the oxidation of certain active groups during the process of denaturation. High pressure in the presence of reducing substances such as glucose and ascorbic acid in N-salt soln. causes the denatured proteins to go into soln. Denatured ovalbumin thus regenerated differs from the original native and the denatured proteins. Horse γ -globulin was similarly studied with much the same results. Cryst. human serum albumin in 0.5N phosphate buffer at pH 6.0 was heated at 70° for 13 min. and then subjected to a pressure P of 2000 atm. for 20 hrs. The regenerated protein was practically identical with the initial native protein. Partial regeneration of heat-denatured serum albumin can be accomplished with 11% in 1.5 hrs.

Specific immunoprecipitin properties of such regenerated serum proteins remain unaffected. Generally the degree of regeneration that denatured serum protein undergoes depends largely on exptl conditions and particularly on the pH of the medium. No pressure regeneration in a phosphate-buffered soln. could be effected with serum albumin denatured by light or urea; this points to a different denaturing mechanism. Heat-denatured cryst. chymotrypsin can be regenerated to a considerable degree by pressure in a pH-5.4 medium more rapidly than under spontaneous regeneration conditions. Heat-denatured insulin in 1/10N H_2PO_4 (to prevent formation of fibrils) can be regenerated by increased pressure, but its insulin properties remain irreversibly lost. A brief theoretical generalization is presented. As a result of numerous expts. with pressures of:

U.S. Longur

1000, 2000, and 3000 atm., it was concluded that the rate of regeneration of serum albumin can be satisfactorily expressed by a reaction-rate equation of the 1st order. Since the rate of serum-albumin denaturation can be presented by an equation of the 1st order, the mechanism of the process of serum albumin denaturation is of a unimol. type, provided that some possible interaction between the protein and H_2O is not considered. If the mol. of protein in soln. is conceived as a globular entity, then the process of denaturation and regeneration must proceed in each individual globule independently. The comparatively small value of heat of activation indicates that few weak bonds in the denatured globulin are being broken during activation. The pos. and small value of activation entropy likewise indicates that in some parts of the macromol. there may occur link rotations. Throughout the expts. the activation heat remained practically const. and independent of the pressure. Thus, the basic factor that det. the increase in the rate of regeneration under pressure is the change in the activation entropy with change of P . Results of calcs. of equil. const. and thermodynamic values for different temps. and 1000, 2000, and 3000 atm. of P for denatured serum proteins are tabulated. The effect of denaturation and of the reduction in the concn. of the native protein with the increase in P can be explained on the basis of equil. between the native and denatured forms of protein, as per equation $K = (C_d - C)/C$, where C_d is total protein concn., and C is equil. concn. of the native protein. The shift in the denaturation equil. under the influence of p in the direction of native protein is explained by the increase in the molar vol. of the protein during the denaturation process. Equil. concns. of regenerated protein in relation to pressure were obtained by the following equation $\log K_2 = \log K_1 - (\Delta V/2.3RT)(P_2 - P_1)$, where ΔV is the mean value of the protein vol. conversion during the pressure interval P_1 to P_2 . The calcd. approx. values of the equil. const., of the free energy, and of the entropy of denaturation under atm. pressure and 20° indicate that the equil. form of protein under normal conditions is that of denatured protein.

B. S. Levine

3/3

KASATOCHKIN, V. I.

with R. A. Dulitskaya "Examined kinetics and thermodynamics of renaturation under pressure"

report presented at the 10th All-Union Conf. on Highly Molecular Compounds, Biologically Active Polymer Compounds, Moscow, 11-13 June 1958. (Vest. Ak Nauk SSSR, 1958, No. 9, pp. 111-113)

3

CHAKASEATOCHKIN V. I.

Reflection of slow electrons on sublimed tungsten.
V. I. Kaseatohkin. *Acta Physicochim. U. R. S. S. 2*,
317-36(1933)(in German).—On microcryst. sublimed W,
the dispersion of slow electrons (velocity 40-400 v.)
gives values for the internal potential of W of $\phi = 10.5$
 ± 2 v. and of $\phi = 0$ owing to electron interference inside
the crystals. These results agree with those of Rupp
(C. A. 26, 3723, 5632); and of Sproull (C. A. 27, 3391)
if it is assumed that the microcrystals of these authors
were covered by a layer of nonoriented microcrystals.
F. H. Ruthmann

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900

1ST AND 2ND ORDER		PROCESSES AND PROPERTIES INDEX		3RD AND 4TH ORDER	
<p>*Diffraction of Slow Electrons on Sublimed Tungsten. V. I. Kasatchkin <i>(Zhurnal Fizicheskoy Khimii (J. Phys. Chem.), 1935, 9, (8), 1602-1613) [In Russian.]</i> The dispersion of electrons at speeds of 40-400 v. has been studied at a layer of micro-crystals of sublimed tungsten. The value of the internal potential of tungsten, determined by displacement of maxima, is 10.5 ± 2 v. and is independent of the speed of the electrons. All the maxima can be divided into two groups, with internal potentials 10.5 and 0 v., respectively. The existence of these groups is the result of electronic interference either in the crystal or at its stepped surface. The diffraction observed in the experiments of Rupp and Sproull occurred not at the clean facet of the single crystal, but at the layer of unoriented micro-crystals which covered the surface of the single crystal.—N. A.</p>					
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>					
1ST AND 2ND ORDER		3RD AND 4TH ORDER		5TH AND 6TH ORDER	
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z		A B C D E F G H I J K L M N O P Q R S T U V W X Y Z		A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
A-Z																										A-Z																									
<p style="text-align: center;">PROCESSES AND PROPERTIES INDEX</p> <p style="text-align: center;">Metallic Combination in Accordance with the Combined Method of Approximation. H. Hellmann and W. Kasatotschkin (<i>Acta Physicochimica U.S.S.R.</i>, 1936, 8, (1), 23-44). [In German.] The method of wave-mechanics, taking into account interactions between valency electrons and atomic residues, is applied to determine values of the atomic constants of potassium, rubidium, cesium, magnesium, and calcium. Agreement between theoretical and empirical data relating to magnesium establishes the correctness of the assumptions made. The theory is applied, with satisfactory results, to calculate values of the lattice constants, heats of sublimation, and compressibilities of the elements referred to. Making certain assumptions, the theory gives values of the energies of electron emission of the alkali metals which are of the correct order of magnitude. --J. N. G. T.</p>																																																			
<p style="text-align: center;">ASM-AIA METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			
<p style="text-align: center;">MATERIALS INDEX</p>																																																			

BC

STRUCTURE OF POTASSIUM TELLURIDE. V. KARATYCHENKO and V. KOROV (J. Phys. Chem. Russ., 1958, 32, 2263). E-Ray analysis shows that K_2O has a tetragonal cell-centered lattice of the Cu_2F_8 type; $a = 5.70$, $c = 3.75$ Å; the cell contains 4 K and 8 O. Distance of closest approach of two O 1.28 Å. The structure is analogous to those of SiO_2 and BaO_2 ; the correct formula is thus K_2O , and not K_2O_2 . E. R.

2-1

ASB 15-A METALLURGICAL LITERATURE CLASSIFICATION

1507380 2
1507380 419 049 001
03413702
1507380 419 049 001

26

KASATOCHKINA, V. I.

Structure of mixed (lead) chromates. N. S. Rassudova and V. I. Kasatochkina. *Org. Chem. Ind. (U. S. S. R.)* 3, 634-41(1977); *cf. C. A.* 27, 1325. Mixed pigments obtained by co-pptn. of PbO and alk. earth carbonates in 10% $AcOH$ proved to be superior in structure uniformity and in making paints to the products resulting by sep. pptn. or mech. mixt. of the ingredients. The x-ray patterns and a revealed the presence of a 2-phase system, consisting chiefly of the triple salt of $PbCrO_4 \cdot PbSO_4$ with an alk. earth sulfate and some free alk. earth sulfate. $PbCrO_4 \cdot PbSO_4 \cdot 4CaSO_4$ retains the monoclinic system of pure $PbCrO_4 \cdot PbSO_4$, accompanied by a slight contraction of the lattice, and resembles it in the structure and properties more than the triple salts derived from $BaSO_4$ and $SrSO_4$. In the formation of $PbCrO_4 \cdot PbSO_4 \cdot 3BaSO_4$ and $PbCrO_4 \cdot PbSO_4 \cdot 3SrSO_4$, the monoclinic lattice of $PbCrO_4 \cdot PbSO_4$ is radically reconstructed. The presence of excess sol. salts of alk. and alk. earth metals during the pptn. of mixed chromates affects the crystal habitus without changing the structure of the cryst. lattice. The needle and rod-like cryst. ppts. are better pigments for paints than the granular cryst. pigments obtained by pptn. in the presence of $NaCl$, KCl and $CaCl_2$. Chas. Blanc

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

REGION: 1710311VA

140280 14

140280 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495 1496 1497 1498 1499 1500

1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599 1600

SC

R-1

Structure of inorganic peroxides. V. I. KARATOTSKIN (J. Phys. Chem. Russ., 1937, 9, 832-834). Arguments against Kazarnovski's peroxide formula H_2O-O-H , and for the alternative formula H_2O_2O , with a "mol." O_2 , are advanced. E. R.

AND SLA METALLURGICAL LITERATURE CLASSIFICATION

METALLURGICAL LITERATURE CLASSIFICATION										METALLURGICAL LITERATURE CLASSIFICATION									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

1st and 2nd copies

2

CA

X-ray investigations of the structure of potassium peroxide, KO_2 . V. Kasatkikhin and V. Kotov. *J. Tech. Phys.* (U. S. S. R.) 7, 1484-75(1937); *Chem. Zentr.* 1938, II, 1183; cf. *C. A.* 30, 6853; 32, 441.

Geometric evaluation of powder photographs according to the method of Debye-Scherrer with unfiltered $\text{Cu K}\alpha$ radiation and indexing according to the method of Hull-Davey (cf. *C. A.* 16, 1703) showed a hexagonal elementary cell with the dimensions $a = 5.0 \text{ \AA}$ and $c = 6.72 \text{ \AA}$ and including 4 mols. KO_2 . The structure corresponds to the CaC_2 type. The space group is D_{6h}^{2h} . The coordinates of the 4 K atoms are: $000, 0\frac{1}{2}, 0\frac{1}{2}, 0\frac{1}{2}$ and those of the 8 O atoms: $\frac{1}{2}, 0, 0, \frac{1}{2}, 0, 0, \frac{1}{2}, 0$. The lattice $a, 0, 0, \frac{1}{2} = a, \frac{1}{2}, \frac{1}{2}, \frac{1}{2} = a$ ($a = 0.1945$). The lattice of the higher K peroxide is formed by K ions which alternate with singly charged ions of O_2^- . It is similar to a deformed KCl lattice. The distance between the O atoms of the ions of the mol. amounts to $d_{\text{O-O}} = 1.28 \text{ \AA}$.

M. G. Moore

COMMON ELEMENTS

COMMON VARIABLE MOIE

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

140080 4A

140080 4A 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

140080 4A 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

COMMON ELEMENTS		PROCESSES AND PROPERTIES INDEX		COMMON VARIABLE INDEX	
2m		<p>*Orientation of Surface Crystals of Brass by Abrasion. N. A. Shishakov and V. I. Krasotichkin (<i>Dokl. Akad. Nauk S.S.S.R. (Compt. rend. Acad. Sci. U.R.S.S.)</i>, 1938, 20, (4), 277-278 (in Russian); and <i>Compt. rend. (Doklady) Acad. Sci. U.R.S.S.</i>, 1938, [N.S.], 20, (4), 277 (in English)).—Brass which has been ground in one direction only gives an electron-diffraction diagram which indicates almost complete orientation of a number of the crystals. When the photograph is taken with the incident beam perpendicular to the direction of the scratches, the axis along which crystals are oriented is the [110] direction. No such effect is observed in the unidirectional abrasion of clean copper, iron, or steel.—N. A.</p>		u	
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION					
GROUP		SUBGROUP		SUBSUBGROUP	
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	

1st and 2nd Orders		Processes and Properties Index		1st and 2nd Orders	
C A				9	
<p>Orientation of crystals on the surface of brass during polishing. N. A. Shishakov and V. I. Kamotchkina. <i>Exptl. Theoret. Phys. (U. S. S. R.)</i> 8, 1215-17 (1968); <i>Chem. Zentr.</i> 1969, II, 4439.—In the polishing of brass with emery an orientation of the crystals of emery on the surface of the brass was observed, the (1 1 0) axis of the crystal lying in the direction of polishing. M. G. M.</p>					
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION					
GROUPS		SUBGROUPS		SUBGROUPS	
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	

C4

9

Electronic diffraction in the surface layers of metal alloys. V. Kasatokin. *Compt. rend. acad. sci. U. R. S. S.* 22, 37-8(1930)(in English).--X-ray Debye reflection expts. on emery-polished Mn-steel and Cr-Mn-Ni-steel showed the presence in each case of both α - and γ -steel phases (martensite and austenite), but the electronograms showed only the α -phase. With brass, x-ray expts. showed both α - and β -phases, but electronograms only the α -phase. In each case the electronograms do not show the lines of those phases which are unstable at low temps. X-rays penetrate too deeply to show changes in the surface layers due to various treatments, but electronic diffraction apparently shows the condition of the surface where the unstable phases have been disintegrated by intense deformation and temp. rise.
George Ayers

COMMON ELEMENTS
COMMON VARIABLE INDEX
OPEN
MATERIALS INDEX
METALLURGICAL LITERATURE CLASSIFICATION
FROM BOWEN
SELECT ONE OR MORE
GROUPS
SUBGROUPS
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA AB AC AD AE AF AG AH AI AJ AK AL AM AN AO AP AQ AR AS AT AU AV AW AX AY AZ BA BB BC BD BE BF BG BH BI BJ BK BL BM BN BO BP BQ BR BS BT BU BV BW BX BY BZ CA CB CC CD CE CF CG CH CI CJ CK CL CM CN CO CP CQ CR CS CT CU CV CW CX CY CZ DA DB DC DD DE DF DG DH DI DJ DK DL DM DN DO DP DQ DR DS DT DU DV DW DX DY DZ EA EB EC ED EE EF EG EH EI EJ EK EL EM EN EO EP EQ ER ES ET EU EV EW EX EY EZ FA FB FC FD FE FF FG FH FI FJ FK FL FM FN FO FP FQ FR FS FT FU FV FW FX FY FZ GA GB GC GD GE GF GG GH GI GJ GK GL GM GN GO GP GQ GR GS GT GU GV GW GX GY GZ HA HB HC HD HE HF HG HH HI HJ HK HL HM HN HO HP HQ HR HS HT HU HV HW HX HY HZ IA IB IC ID IE IF IG IH II IL IM IN IO IP IQ IR IS IT IU IV IW IX IY IZ JA JB JC JD JE JF JG JH JI JJ JK JL JM JN JO JP JQ JR JS JT JU JV JW JX JY JZ KA KB KC KD KE KF KG KH KI KJ KK KL KM KN KO KP KQ KR KS KT KU KV KW KX KY KZ LA LB LC LD LE LF LG LH LI LJ LK LM LN LO LP LQ LR LS LT LU LV LW LX LY LZ MA MB MC MD ME MF MG MH MI MJ MK ML MN MO MP MQ MR MS MT MU MV MW MX MY MZ NA NB NC ND NE NF NG NH NI NJ NK NL NO NP NQ NR NS NT NU NV NW NX NY NZ OA OB OC OD OE OF OG OH OI OJ OK OL OM ON OP OQ OR OS OT OU OV OW OX OY OZ PA PB PC PD PE PF PG PH PI PJ PK PL PM PN PO PP PQ PR PS PT PU PV PW PX PY PZ QA QB QC QD QE QF QG QH QI QJ QK QL QM QN QO QQ QR QS QT QU QV QW QX QY QZ RA RB RC RD RE RF RG RH RI RJ RK RL RM RN RO RP RQ RR RS RT RU RV RW RX RY RZ SA SB SC SD SE SF SG SH SI SJ SK SL SM SN SO SP SQ SR SS ST SU SV SW SX SY SZ TA TB TC TD TE TF TG TH TI TJ TK TL TM TN TO TP TQ TR TS TT TU TV TW TX TY TZ UA UB UC UD UE UF UG UH UI UJ UK UL UM UN UO UP UQ UR US UT UV UW UX UY UZ VA VB VC VD VE VF VG VH VI VJ VK VL VM VN VO VP VQ VR VS VT VU VW VX VY VZ WA WB WC WD WE WF WG WH WI WJ WK WL WM WN WO WP WQ WR WS WT WU WV WW WX WY WZ XA XB XC XD XE XF XG XH XI XJ XK XL XM XN XO XP XQ XR XS XT XU XV XW XX XY XZ YA YB YC YD YE YF YG YH YI YJ YK YL YM YN YO YP YQ YR YS YT YU YV YW YX YY YZ ZA ZB ZC ZD ZE ZF ZG ZH ZI ZJ ZK ZL ZM ZN ZO ZP ZQ ZR ZS ZT ZU ZV ZW ZX ZY ZZ

COMMON ELEMENTS		STRUCTURE AND PROPERTIES INDEX		LIGHT BOMBING	
GROUP	PERIOD	GROUP	PERIOD	GROUP	PERIOD
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9
10	10	10	10	10	10
11	11	11	11	11	11
12	12	12	12	12	12
13	13	13	13	13	13
14	14	14	14	14	14
15	15	15	15	15	15
16	16	16	16	16	16
17	17	17	17	17	17
18	18	18	18	18	18

CA

2

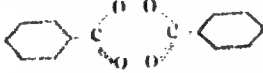
Structure and properties of the univalent peroxide group.
V. Kazantchik (I. V. Stalin Inst. of Steel, Moscow).
Metall. rev. acad. sci. U.S.S.R. 47, 101 (1953);
Doklady Akad. Nauk S.S.S.R. 47, 100 (1953).
The size of the peroxide ion O_2^{2-} is computed by analysis
of the crystal lattice of KO_2 and compared with O_2 and
 O_2^{2-} . For O_2 the O-O distance = 1.37 Å. $r_{O_2} =$
3.01 Å. $r_{O_2^{2-}} = 4.65$ Å. For O_2 $r_{O_2} = 2.40$ Å. $r_{O_2^{2-}} =$
3.01 Å. Owing to the similarity to the KCl structure it is
estimated that the dissociation energy of $O_2^{2-} = 3.82$ e.v. and the
electron affinity of $O_2 = 3.81$ e.v. The numerous proc-
esses associated with the formation and decomposition of peroxides
in which the O_2 mol. takes part, as well as the oxidation-
reduction properties of peroxides, can be described by a
general electronic scheme of the course of the reaction.
At the first stage of chem. interaction one 3-electron re-
sultant bond is ruptured in the O_2 mol. owing to the addn. of
the electron of the oxidized substance. A peroxide of the
type $R-(O-O)$ is thereby formed which possesses the
non-satd. properties of the free radical and is transformed
upon further interaction into the common peroxide of the
type $R-(O-O)-R$. The transition is accompanied by
the rupture of the second 3-electron bond. To account for
the formation of aldehydes, alcoh., and other products of
oxidation of hydrocarbons, etc., it is necessary to consider
the decompn. of the peroxide group and the reverse proc-
ess of recombination of radicals and atomic ions.
H. G. McCann

ASS-SLA METALLURGICAL LITERATURE CLASSIFICATION

FROM 11V-22178

EXISTING ONE ONLY

EXISTING ONE ONLY

117 AND 120 CODES		PROCESSES AND PROPERTIES INDEX	
<p>KASATOCHKIN, V.</p> <p>X-ray study of the structure of benzoyl peroxide. V. Kasatochkin, S. Perlina, and K. Ablesova (Moscow Metallurgical Institute of Chemical Technology). <i>Compt. rend. acad. sci. P. R. S. S. R.</i> 47, 36-8(1945); <i>Doklady Akad. Nauk S. S. R.</i> 47, 37-9(1945). Analysis of Laue diffraction patterns and rotation and oscillation diagrams for Bz_2O_2 fit the symmetry class as D_{2h} and the elementary cell dimensions (in Å.) as: $a = 8.91$, $b = 9.15$, $c = 11.31$, with an axis ratio $a:b:c = 0.822:1:0.600$. The no. of mols. in a cell is four. The calcd. d. is 1.328 as compared to an observed value of 1.334. Bz_2O_2 should be ascribed the sym., elongated structure:</p>		<p>10</p>	
		<p>where $l_c - a = 1.47$ Å., $l_c - b = 1.45$ Å., $l_c - c$ (for the aliphatic bond) = 1.64 Å., $l_c - c$ (for the benzene ring) = 1.41 Å., and where $l_c - c = 3.0$ Å. is the shortest distance between the C atoms of adjacent unassociated. mols. along the c axis. The valence angle in the peroxide group is calcd. as $113^\circ 15'$. In the lattice the 4 elongated mols. with their peroxide groups in close contact, form an assoc. active bromides are those of metals of the 2nd and 3rd groups.</p>	
<p>ASB-55A METALLURGICAL LITERATURE CLASSIFICATION</p>			
<p>GROUPS</p>		<p>SELECT ONE ONLY</p>	
<p>GROUPS</p>		<p>SELECT ONE ONLY</p>	

CF
X-ray investigation of the crystallization of vulcanized rubber on stretching. B. V. Lukin and V. I. Kasatochkin. *J. Tech. Phys.* (U.S.S.R.) 16, 1383-8(1946) (in Russian).
The method of Field (C.A. 35, 2629, 8338) was used to det. by debyogram microphotometry the percentages of cryst. phase c in 4 samples of rubber vulcanized at 143° for varying lengths of time τ (in min.), after stretching, as a function of τ . Four samples (I-IV) were prepd. from a base mixt. of smoked sheet rubber 100, S 7, ZnO 5, stearic acid 2, without and with the addn. of mercapto-benzothiazole 0.3, diphenylguanidine 0.378, and a thium accelerator 0.127, resp. The samples were stretched 300%, except III, which could be stretched 600% only after τ 60 min., and IV, which was stretched 600% only after τ 3, and 5 min. Each of the 4 samples showed a max. c at a certain τ , increasingly shorter in the order I, III, II, IV; the height of the max. increased in the order I, III, II (83, 71, 75%), for a given sample, it increases with the degree of stretching, but the position of the max. remained unchanged for a given sample: c fell to zero at τ 55 and 108 min. for 300% stretching and 400%, resp. Curves of tensile strength σ against τ had a max. at about the same τ as curves of c (100, 60, and 20 min. for I, III, and II, resp.). Stress-strain curves (σ vs. ϵ) show, for a given strain, stresses increasing with τ up to τ 40 min., after which they decreased with further increase in τ . Curves of the ultimate elongation ϵ of I and III had minima (at τ 10, τ 12, and τ 15, τ 14%, resp.).

then maxima (at τ 30, τ 21, and τ 68, τ 25, resp.). The observations lead to the conclusion that, in addn. to progressive cross-linking, eventually resulting in prevention of crystn., oxidative destruction accompanying vulcanization takes place. The increase of c at its max. in the presence of accelerators is explained by the shorter τ and correspondingly lesser accumulation of oxidation products; on the other hand, the observed reversal of the stress from τ 60 upwards, indicates increased plasticity due to such an accumulation. The fact that the decrease of c beyond the max. is the more marked the less the stretching is linked with a corresponding increase in creep, N. Thom inversely related to c .

30

CA

Application of infrared absorption spectra to the investigation of the oxidation process of sodium butadiene rubber. B. A. Dugan'kin, V. Kasatoghin, N. Klausen, and A. Smirnova (Moskov. Inst. khimicheskoi promyshlennosti). *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* 12, 818-20 (1948).—Measurements were made with a Hilger spectrometer in the region 2.5-11.3 μ . The receiver was a Bi Ag thermopile. The rubber was investigated as a film 45-50 μ thick cast on water. The absorption spectrum of Na butadiene rubber shows a band near 3.35, caused by CH vibrations, a band near 6.1 μ by C:C vibrations, a band near 6.9 μ attributed to the deformation of the methylene group, and 2 bands at 10.75 μ and 11.0 μ , caused by deformations of the group $-\text{C}(\text{CH}_2)-$. Polymers (1) $(-\text{CH}_2\text{CH}=\text{CHCH}_2\text{CH}_2\text{CH}=\text{CHCH}_2-)$ and (2) $(-\text{CH}_2\text{CH}(\text{CH}_2\text{CH}=\text{CHCH}_2\text{CH}_2\text{CH}=\text{CHCH}_2)-)$ can be obtained. The second predominates. The films were oxidized in air at 142-3° for 5, 10, 20, 30, 40, and 60 min. Bands corresponding to the OH and the CO group appear; also bands corresponding to vibrations of $-\text{C}(\text{O})\text{C}-$ (8.5 μ). Oxygen acts on the double bonds and the appearance of new groups accounts for the change in the properties of Na butadiene. S. Pakswi

KASATOCHKIN, V. I.

... of the ...
... and its ... by elongation, for various stages of vul-
... Natural rubber smoked sheet gives ...

ments of the same thickness give different intensities of the

increase of intensity of the crystal interference. This indicates that the crystal phase arises from that part of the amorphous phase which does not take part in x-ray scattering in the form of the amorphous ring, but rather simulates gaseous scattering. This probably represents parts of chains that are not held together by van der Waals forces and the irregularities of orientation of chain molecules.

steadily. Heating smoked sheet rubber in a vulcanization press 1 hr. (especially during the initial period) greatly reduces the ability to form crystal patterns on elongation. This can be explained by oxidative destruction. However, more detailed study of aged rubber shows the crystal ability without loss of strength and elongation with increase of age.

When aged at 100°C and elongated 500% shows a continuous diffuse pattern of the gaseous type; this does not seem to be explainable by the action of the crystal areas.

C. W. Kinslow

KASATOCHKIN V. *Vulcanized Natural Rubber*

3445. Molecular structure and properties of
rubber. V. I. KASATOCHKIN and R. V. LUKIN
Dokl. Akad. Nauk SSSR, 1949, 67, 683-5;

R. Chem. Tech., 1952, 35, 12-4. Cf. this journal,
1950, 23, 400. A translation of this paper now
appears. 6324

13267* X-Ray Study of the Crystallization of Vulcanized Rubber During Stretching. II. V. I. Kasotichkin and B. V. Lukin. *Rubber Chemistry and Technology*, v. 24, July-Sept. 1951, p. 511-549. [Translated from *Zhurnal Tekhnicheskoi Fiziki* (Journal of Technical Physics), v. 19, Jan. 1949, p. 76-83.] Presents a detailed study of the crystallization curves of vulcanization in relation to the elongation of vulcanized mixtures.

P.A.

30

An x-ray investigation of the crystallization of vulcanized rubber on stretching. II. V. I. Kasatovichkin and B. V. Lukin. *Zhur. Tekh. Fiz.* 19, 78 (1989); cf. C.A. 41, 5747d. In smoked sheet, without previous plasticization and contg. no fillers, vulcanized at 143° for lengths of time τ from 0 to 60 min., and stretched 500%, the fraction f of the cryst. phase decreases regularly, from 70 to 50%, with increasing τ because of destructive oxidation. Within the same limits, the mol. wt. (by viscosity of dil. solns.) falls from 70,000 to below 40,000, and the creep, measured under 1 kg./sq. cm. at 18° in 50 hrs., rises from 150 to 450%. The tensile strength σ falls linearly from 18 to 12 kg./sq. cm. With smoked sheet (100) + S (2), ZnO (5), stearic acid (2), and mercaptobenzothiazole (0.6), f rises steeply to a max. within the 1st 40 min., then falls off slightly and remains const. with further increasing τ . The curve of σ has a similar shape, except that σ falls off slightly with long τ . This latter effect is even more pronounced with smoked sheet with the same percentages of S, ZnO, and stearic acid, but with thiuram (0.854) or diphenylguanidine (0.756) instead of mercaptobenzothiazole. In smoked sheet with the latter, but with 7 instead of 2% S, the max. f is sharper, and its fall with further prolonged τ somewhat more marked. The factor responsible for the decrease of f is evidently the formation of S bridges which reduce the mobility of the mols. and thus counteract crystn.; with a low S content of 2%, the process of spatial network formation is practically completed at the optimum, and has no further effect on more prolonged τ . The subsequent fall of both f and σ is attributed to the plasticizing

action of the oxidation products of rubber. This is borne out by the observed fall of the modulus of elasticity with τ prolonged beyond the optimum in mixts. with 2% S. This is not so with 7% S, where prolonged τ results in further increasing modulus, owing to continued growth of bridges. Addn. of 30% plasticizer lowers f at all stages of vulcanization; dibutyl phthalate has a stronger f -lowering effect than mazut. The tensile strength σ is an increasing function of f over the whole range of vulcanization, but, for a given mixt., each f is assocd. with 2 values of σ , one corresponding to the 1st phase, the other to the 2nd phase of the vulcanization (beyond the optimum). This indicates a different nature of the strength in the 2 phases. The amt. of bound S increases with time at the initial stages of the vulcanization, but the material still remains plastic as long as the spatial network has not spread throughout its whole mass. This may account for the fact that a relatively small change in bound S can be accompanied by a relatively large change of f . Crystn. of vulcanizates in the 2nd phase, beyond the optimum, is governed by the d. of the spatial network. More completely crystl. vulcanizates have a greater σ , owing to the greater no. of chains. However, high tensile strength may still be present, even though crystals may have disappeared almost completely; in that case, σ is detd. by oriented chains. Inhibition of crystn. by bound S is due to the noncoincidence of the C-S bond distance and the lattice period of cryst. rubber. Non-bridge S lowers the crystallizability by occupying points which otherwise might have formed part of the crystal.

N. Thon

CA

Molecular structure and properties of rubber. V. I. Kasatoshkin and B. V. Lukin. *Doklady Akad. Nauk S.S.S.R.* 67, 683-6 (1949).—In smoked-sheet rubber, vulcanized NK-1 (smoked sheet 100, ZnO 3, stearic acid 2, S 7, mercaptobenzothiazole 0.3), and vulcanized NK-3 (100, S 2, 2, 0.6), the intensity of the amorphous ring in x-ray diffraction was const. over a wide range of extension, notwithstanding the steady increase in intensity of the spots corresponding to an increase in the amt. of the cryst. phase up to 60%. This constancy of the intensity of the amorphous ring on stretching is interpreted as an indication that the crystals are not formed from the "liquid" part of the amorphous rubber, but from what is termed its "gaseous" part, presumed to consist of free fragments of mol. chains. The considerable change in the η of rubber on crystn. is in accord with this idea. The "gaseous" part of the amorphous rubber, which should scatter x-rays as a gas, det. the elastic properties of rubber. Comparison of the intensities of the amorphous ring of 3 samples of different elasticities, plasticized and unplasticized smoked sheet, and a highly elastic vulcanizate NK-31 (strength 163 kg./sq. cm., relative elongation 900%, creep under 20 kg./sq. cm. in 50 hrs., 5%), as a function of the thickness (up to 1.0 mm.), showed the highest intensities for low-elasticity and high-plasticity plasticized smoked sheet, lowest intensities for the very highly elastic NK-31, and intermediate values for the unplasticized smoked sheet.

N. Thon

ASATOCAR/M, V L

4119. X-ray investigation of the process of
unleashing of rubber. B. Y. L. 814, and V. Y. 17 2

Rubber Abs.
Vol. 31
Nov. 1953
Vulcanised
Natural
Rubber

4664. X-ray investigation of the crystallisation of vulcanized rubber on stretching. IV. V. I. KASATOCHKIN and B. V. LONIN. Zhur. Tekh. Fiz., 1950, 20, 1160-6; Chem. Abs., 1953, 47, 7811. Cf. this journal, 1950, 28, 565. The number of crystals was determined as a function of the period of vulcanisation for smoked sheet rubber stretched 400% without and with carbon black as filler, using varying proportions of carbon black, sulphur, stearic acid, zinc oxide, MBT, and thiuram. Without carbon black, crystallisation began to be apparent after 10 min., growing rapidly at first, slowing down, reaching a 60% maximum after 60 min., remaining constant to 220 min., and falling to zero at 300 min. Using 30% carbon black, maximum was reached very soon after the beginning of vulcanisation, fell slightly within 20 min., and then reached a constant value of 60%. This checks with the relationship between the content of rubber crystals and the content of bound sulphur. Carbon black reduced the modulus of elasticity. Without black, tension strength increased but little with the amount of sulphur crystals; with black present, it was small while the sulphur content was small, but became four times as large when the sulphur content reached its optimum. Carbon black also increased the crystallisation of plasticised rubber.

(over)

Dr. V. I. Kuznetsov

The elongation of the X-ray spots indicates that carbon black makes the orientation of the crystals less definite. With carbon black, thiuram makes the rubber crystals more nearly perfect, the explanation of this effect by adsorption of the rubber mol. chains to the carbon particle surface being confirmed by the fact that carbon causes crystallisation of the rubber even in the absence of vulcanising agents, and also by the difference between the crystal orientation and the direction of the mechanical forces in the stretched rubber. The orientation of the mols. in the direction of elongation, coupled with restricted rotation due to adsorption, creates an effect of single-dimensional crystals. Two-dimensional crystals are likely to be formed at the surfaces of adsorption.

63423

KASATOCHKIN, V. I.

125. X-RAY STUDY OF HUMIC ACIDS (OF COAL) Kasatochkin, V.I.,
Kukharensko, T.A., Zolotarevskaya, E. Yu, and Razumova, L.L.
(Doklady Akad. Nauk SSSR (Rep. Acad., Sci. U.S.S.R.), 1950,
vol. 74, 775-778; abstr. in Chem. Abstr., 1952, vol. 46, 1227,
1228). Humic acids are aromatic hydroxy carboxylic acids of high
molecular weight. Changes in their molecular structure during
the gradual coalification were studied by X-ray examination of
peats and soft coals of different localities, and artificially
oxidized coal (with ratios C:H from 13.2 to 26.8). The interferences
are increasingly distinct and sharper with advancing degree of
coalification and molecular rearrangement. The humic acid from
coal shows three maxima which correspond to a double hexagonal
carbon lattice similar to that in graphite. With progressive
coalification the ordered lattice of the aromatic nuclei of the
humic acid increases: the disordered part appears peripheral owing
to the groups of the molecules. The changes of the ratio C:H
as an indicator for increasing condensation of aromatic nuclei
parallel these diffraction phenomena. The calculated number of
rings in the nucleus varies between 1 and 10 or more: the progressive
coalification corresponds to their condensation to increasingly (over)

~~212. WOOD PITCH. Chernenko, A.A. and Borisov, I.I. (Zh. Fiz. Khim. Topliwa (Fuel Econ.), May 1950, 35, 36; abstr. in Chem. Abstr., 1952, vol. 46, 1228). Dehydration and distillation of wood pitch give a solid and liquid fuel, both of which have low calorific values and are easily burned in any type of burner. Losses during~~

KASATOCHKIN, V. I.

USSR/Fuels - Coal, Structure

Sep 51

"Certain Problems of Studying the Fine Structure of
Coals," V. I. Kasatochkin

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 9,
pp 1321-1334

Presents results of studying fine structure of
coals and their components by X-ray and electron-
microscope methods. Discusses X-ray diffraction
in coals, mol structure of anthracite, metamorphism
of coals and their petrographic components, sapro-
pelites and carbonaceous substances of combustible
shales, humic acids, and thermal processing of
coals. Submitted 21 Apr 51.

205T33

KASATOCHKIN, V. I.

LC

187195

discussions after the lecture: Z. G. Plasker,
I. Kasatochkin, V. I. Kitaygorodskiy, N. S.
Kostetskaya, V. I. Karpov, V. I. Denilov.
Lecture read at 3d All-Union Conference on
Use of X-rays in Study of Materials held 19 -
24 Jun 50 in Leningrad.

LC
USSR/Physics - X-ray Analysis, Rubber Mar/Apr 51
(Contd)

Authors lectured on scattering of X-rays in
amorphous caoutchouc, variations in mol struc-
ture of caoutchouc under fatigue and wear, and
crystal of filler vulcanizers of syn-
thetic rubber. The following participated in
187195 6.

pp 209-217

"Iz Ak Nauk SSSR, Ser Fiz" Vol XV, No 2,

USSR/Physics - X-ray Analysis, Rubber Mar/Apr 51
"The X-ray Analysis of the Molecular Structure
of Rubber," V. I. Kasatochkin, B. V. Lukin, O. I.
Sci. Res Inst of Tire Ind

13269* Application of Infrared Absorption Spectra to Studies of the Oxidation of Sodium-Butadiene Rubber. B. Dogadkin, B. Kusatichkin, N. Klauzen, and A. Smirnova. *Rubber Chemistry and Technology*, v. 24, July-Sept. 1951, p. 591.

596. [Translated from *Doklady Akademii Nauk SSSR* (Reports of the Academy of Sciences of the USSR), Physics Series, v. 12, no. 5, 1948, p. 616-620.]
Presents a qualitative and limited quantitative analysis of those groups which originate during oxidation and also an examination of the structures which determine the changes of the physical and chemical properties in the reaction of rubber with molecular oxygen.

ASTM S1A METALLURGICAL LITERATURE CLASSIFICATION

13269-43-179

13269-43-179

KASATCHEKIN, V. I.

2

88. FINE STRUCTURE OF COALS. Kasatchekin, V. I. (Invest. Akad. Nauk SSSR, Otdel. Tekh. Nauk (Bull. Acad. Sci. U.S.S.R., Sect. Tech. Sci.), Sept, 1951, 1521-1534).

Results are given of (1) X-ray examination of brown and bituminous coals, anthracite, schungite and graphites, (2) X-ray and electron microscope examination of the petrographic constituents of coals, and (3) X-ray examination of changes in molecular and intermolecular structure of coals during thermal treatment. A suggestion is made for quantitative estimation of the degree of graphitization.

immediate source clipping

CA

Molecular aggregation in amorphous polymers. V. I. Kasatichkin and H. V. Lukin. *Doklady Akad. Nauk S.S.S.R.* 77, 81-4 (1951).—The previously given (C.A. 44, 23906) interpretation of the structure of amorphous rubber as consisting of a liquid-type part, giving an interference max. of the scattered intensity of x-rays as a function of the scattering angle (due to near-range order), and a disordered gas-type part, is further corroborated by the change of the scattering intensity curves with the temp. With rising temp. (20, 80, 120°), the max. becomes increasingly flatter, and the intensity in the range of small scattering angles increases. The curves are very strongly reminiscent of Noll's (*Phys. Rev.* 42, 334 (1942)) curves for the x-ray scattering intensity of H_2O at different temps., with the max. disappearing completely at 210°. The total scattering intensity $I = I_g + I_l$, where the subscripts g and l refer to "gaseous" and the "liquid" part, resp. The former is $I_g = PN_g F^2$, where F = structure amplitude of scattering by single links of the mol. chains (determ. by interference of the radiation coherently scattered by the atoms of the same chain link), N_g = no. of links constituting the "gaseous" part, and $F = (1 + \cos^2 \theta)/2$, where θ = scattering angle. The intensity I_l of the "liquid" part, deterd. by interference of the radiation coherently scattered by links of neighboring chains, as given by Debye's theory of scattering in liquids,

is $I_l = PN_l F^2 I$, where $I = \int_0^\infty 4\pi r^2 (1 - W) (\sin sr/sr) dr$, where W = probability of neighboring disposition of links, ρ = mean d., $s = (4\pi \sin \theta)/\lambda$, and $4\pi r^2 dr$ = mass of a spherical shell of thickness dr at a distance r from a given link. In the case of complete disorder, $W = 1$, and $I = PN F^2$, where N = total no. of links. For high θ , the integral tends to zero, and I tends to the above value for a completely disordered "gaseous" state. For small θ , the integral tends to unity, $I_l = 0$, and $I = I_g$. The coexistence of the "gas" and the "liquid" phases in an amorphous polymer is due to the difficulty of close packing of all links of neighboring mol. chains. The same cause underlies the incomplete crystn. of polymers, as evidenced by x-rays. N. Thon

KASATOCHKIN, V. I.

USSR

Changes in the fine structure of fossil coal in various stages of metamorphism. V. I. Kasatochkin, E. Yu. Zolotarevskaya, and L. I. Barinova. *Izvestiya Akad. Nauk S.S.S.R. 79* (1978) 60-62, 47, 1157-60.

The emergence of interference max. and the progressive increase in the sharpness of the x-ray diffraction pattern of a series of Donets basin fossil coals of increasing degree of metamorphism indicates the growth of mol. regularity with metamorphism. However, unlike graphite, in anthracite and lesser coals the hexagonal planar C atom lattices formed do not line up with three-dimensional regularity. It is concluded that under the natural conditions of metamorphism of org. substances, the carbon at the final stage of carbonization is similar to amorphous. X-ray analysis of vitrinite and fusinite sep'd. from coal in various metamorphic stages shows that only vitrinite undergoes over-all structure changes typical of coal during carbonization. Fusinite, carbonized in the early stages of metamorphism, contains some orientation in packs of parallel carbon lattices. The resistance of spore coal to carbonization leads to the preservation of the form of the structural elements during the early stages and eventually to a mol. structure relatively less aromatic and planar and more chainlike in nature.

KASATOCHKIN, V. I.

(2)

X-ray investigation of the amorphous state of rubber. V. I. Kasatochkin and B. V. Lukin, *Khim. i Fiz.-Khim. Vysokomolekul. Soedinenii, Doklady 7-oi Konf. Vysokomolekul. Soedinenii* 1952, 242-5; cf. C.A. 47, 11964r. — The amorphous scattering of rubber is due to 2 types of disorder, one usually found in gases, the other in liquids. Gases show scattering curves which increase strongly towards low angles, while liquids show a diffuse ring which depends on the av. mol. distances. Measurement of the amorphous scattering of rubber as a function of temp. shows a strong increase of the "gaseous" type of scattering with temp. Curves of scattering at 20, 80, and 120° are given and compared with the scattering of diethyl ether (Noll, C.A. 27, 1819). Prolonged treatment of rubber at high temps. (20 hrs. at 100°) causes an increase of 15-20% in "liquid" scattering. This is expected, since strong oxidation takes place and leads to stronger interchain interaction. H. D. Noether

KASATOCHKIN, V.I.

Molecular structure and properties of hard coal. Doklady Akad. Nauk
S.S.S.R. 86, 759-62 '52. (MLRA 5:11)
(CA 47 no.19:10195 '53)

org. radicals or functional groups. The structure of the principal components of bituminous coals, vitrinite and fusinite, of other carbonized materials and of polymers, in three-dimensional spatial polymers of the structural elements, interconnected through side chains. The structure of carbonized substances is not known.

KASATOCHKIN, V.I.

USSR/Physics - X-Ray Analysis, Molecular Order

"Radiographic Method of Determining the Molecular Ordering in Amorphous Polymers"

V.I. Kasatochkin and B.V. Lukin, Inst of Combustible Minerals, Acad Sci USSR

Iz Ak Nauk SSSR, Vol 17, No 2, pp 219-223

Method is based on quant measurements of intensity of interference maxima and of continuous background of scattered X-rays. Results of tests of coal, graphite, and rubber are tabulated. Received 17 Feb 53.

262T96

KASATOCHKIN, V.I.

May/Apr 53

USSR/ Physics - Electronography of Coal

"Electronographic Investigation of Coal and Anthracite Components,"

V. I. Kasatochkin, E. Yu. Zolotarevskaya, and E. V. Lukin, Inst of Combustible
Minerals, Acad Sci USSR

Iz Ak Nauk SSSR, Ser Fiz, Vol 17, No 2, pp 246-248

Studied basic petrographic components by analyzing interference patterns. Found
2-dimensional character of diffraction and absence of 3-dimensional ordering in
coals such as anthracite, fusain, and vitrain; and in humic acids and soot.

Received 17 Feb 53.

262T100

KASATOCHKIN, V. I.

Chemical Abstracts
Vol. 48 No. 5
Mar. 10, 1954
Fuels and Carbonization Products

Structural changes in coal on heat-treatment. V. I. Kasatochkin and L. L. Razumova. *Doklady Akad. Nauk S.S.S.R.* 88, 91-4 (1953).—Carbonization by heating org. compds. is characterized by formation and the growth of the flat hexagonal lattices of C atoms similar to the atomic monolayer in a graphite crystal. Part of the C as well as H, O, N, and other elements contained in the substance are eliminated as volatile matter. Formation and growth of the C lattices can be observed according to the origin and the increasing sharpness of the interference bands on the x-ray photographs of the products carbonized. The mol. lattices under the influence of the vector field orient themselves parallel one to the other. Interorientation of the C lattices, occurring simultaneously with their growth, is shown by the interference bands (001) as well as by the change of their sharpness on the x-ray photographs. Relation between temp. and C lattices is discussed.
W. Farafonow

(2)

SHISHAKOV, N.A., KASATOCHKIN, V.I., professor; doktor khimicheskikh nauk,
otvetstvennyy redaktor; RAZUMOVA, L.L., redaktor; ZEMLYAKOVA, T.A.,
tekhnicheskii redaktor

[Problems pertaining to the structure of silica glass] Voprosy
struktury silikatnykh stekol. Moskva, Izd-vo Akademii nauk SSSR,
1954. 191 p. (MLRA 8:3)
(Glass)

KASATOCHKIN, V. I.

USSR/Mining-Geochemistry

Card 1/1

Authors : Sapozhnikov, I. M.; and Kasatochkin, V. I.

Title : Geochemistry of Mineral Coals.

Periodical : Vest. AN SSSR, Ed. 2, 21-26, Feb/1954

Abstract : The authors consider the important role of the mineral coals in the light of development of the various branches of industry. They describe, in general terms, the structure, chemical composition and application of the various types of coals, and give the references on the studies and analysis of coals and carbonizers conducted by D. I. Mandeleev, V. I. Yorren, J. Bisco, V. I. Danilov, and A. M. Zubko.

Institution :

Submitted :

Kasatochkin, V. I.

USSR/Chemistry - Physical chemistry

Card 1/1 Pub. 43 - 50/62

Authors : Kasatochkin, V. I.; Shostakovskiy, M. F.; Zil'berbrand, O. I.; and Kochkin, D. A.

Title : About hydrogen bonds in silanols

Periodical : Izv. AN SSSR. Ser. fiz. 18/6, 726-728, Nov-Dec 1954

Abstract : The infrared absorption spectra of trimethylcarbinol and five different silanols: $(CH_3)_3SiOH$, $(CH_3)_2C_2H_5SiOH$, $CH_3(C_2H_5)_2SiOH$, $(C_2H_5)_3SiOH$ and $C_6H_5(C_2H_5)_2SiOH$ were investigated in a range of wave lengths of from 2 - 4 μ to determine the nature of molecular association of silanols and the effect of the Si-atom on the hydroxyl group. It was established, among others, that the chem. properties of silanols, particularly their amphoteric properties, are due to the strengthening of the O-H bond and strong reaction between the oxygen and hydrogen of the neighboring molecules which takes place as result of increased polarity of the O-H bond. Graphs.

Institution : Acad. of Sc., USSR, Institute of Combustible Minerals

Submitted :

KASATOCHKIN, V. I.

USSR.

The submicroscopic structure of coal. V. I. Kasatochkin, V. B. Shlyapnikov, and L. B. Nepomnyashchik. *Doklady Akad. Nauk S.S.S.R.* 96, 647-8 (1954); cf. C.A. 47, 11837a. —The structure of coal was studied with an electron microscope. It was observed that in photographs of the replicas of natural coke there were traces of bubbles of different sizes, whereas the gas bubbles for coal were of uniform size. This fact could be interpreted from the point of view of the equality of the rates of replacement of gas bubbles and yield of gas by diffusion through the coal in the slow process of gas formation during metamorphism. Thus, the sizes of the bubbles were detd. by the ratio of the rates of diffusion and gas formation and, therefore, depended on the nature of the coal and on factors detg. the rate of gas formation. Often it was found that there were fine, individual particles adhering to the replica. It is possible that they actually are soot particles and that their origin is connected with fires occurring during the early stages of formation of the coal seam. Gladys S. Macy

KASATOCHKIN, V.I.; SHOSTAKOVSKIY, M.F.; ZIL'BERBERAND, O.I.; KOCHKIN, D.A.

~~SECRET~~
Hydrogen linkage in silanols. Zhur.fiz.khim. 29 no.4:730-733 Ap '55.
(MIRA 8:8)

1. Akademiya nauk SSSR, Institut organicheskoy khimii.
(Silanol)

KASATOCHKIN, V.I.

FU

The effect of high pressures on the molecular structure of bituminous coals. L. L. Razumova, V. I. Kasatochkin, and M. P. Volnovich. *Doklady Akad. Nauk S.S.S.R.* 193, 1033-4(1955).—X-ray investigation of coal subjected for a short time to pressures of 20,000 kg./sq. cm. showed that the unidirectional compression causes a reorientation of the at. C lattice, with a preferred distribution of their normals in the direction of the active pressure. The conclusion was drawn that the vitrified mass of bituminous coal of medium metamorphic stages is converted to a liquid-flow system under pressure, similar to its state when heated. The conversion to the liquid state is connected with the destruction of side chains, which explains the ease of rotation of the lattice and the formation of anisotropy under pressure. W. M. Sternberg

(2)

KASATOCHKIN, V. I.

B-5

USSR / Physical Chemistry. Crystals.

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 25998

Author : V.I. Kasatochkin, O.I. Zil'berbrand

Title : Roentgenography and Infrared Spectroscopy in Application to
Study of Structure of Humus Substances.

Orig Pub : Pochvovedeniye, 1956, No 5, 80 - 85

Abstract : The curves of absorption in the infrared spectrum range in wave length intervals of 2.8 to 3.9, 5.7 to 6.8 and 7.8 to 11.3 μ are given for humic acids of black earth and strongly podzol soil, fulvoacids from the same soils, and humic acids from the culture of *Aspergillus Niger*. The following bonds were detected: O-H and C-H in aromatic groups (C-H bonds were absent in fulvo-acids of strongly podzol soil), C-H in CH groups, a weak intensity band of C-H in CH₃ groups, C=O in carboxyl groups, and conjugate double bonds C=C. The intensity ratio of the bands C=O and C=C is characteristic of various samples.

Card : 1/2

USSR / Physical Chemistry. Crystals.

B-5

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 25998

Abstract : There is in the spectra of humic acids of the strongly podzol soil and of both the samples of fulvoacids a band of 6.6μ referred to aromatic groups with lateral alifatic substitutes. In the cases of humic acids from *Aspergillus Niger*, a band of 8.0μ is observed; this band is characteristic of oxygen containing aromatic compounds, in which the O atom is directly connected with the C atom of the aromatic nucleus (Bregger J.A., Fuel, 1951, 30, 204 - 208). These results do not contradict the known data of x-ray studies of the molecular structure of humic acids and similar carbonized substances.

Card : 2/2

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 5,
pp 137-138 (USSR) 15-57-5-6649

AUTHOR: Kasatochkin, V. I.

TITLE: X-Ray and Electron-Microscopic Examination of Coal
at Various Degrees of Metamorphism (Rentgenografi-
cheskoye i elektronmikroskopicheskoye issledovaniye
kamennykh ugley raznykh stadiy metamorfizma)

PERIODICAL: Tr. Labor. geol. uglya. AN SSSR, 1956, Nr 6, pp 150-
155

ABSTRACT: X-ray examination of petrographic coal components has
shown that the development of carbon in metamorphism
occurs in the form of flat lattices or a two-
dimensional crystalline lattice. The dimensions and
form of the lattice may be determined from the X-ray.
Metamorphism of the vitrainized substance contributes
most to the development of the crystalline lattice;

Card 1/3

15-57-5-6649

X-Ray and Electron-Microscopic Examination of Coal (Cont.)

the fusain changes little in form. The crystalline lattice develops somewhat more slowly in the structured elements than in the vitrain-ized substance. The process of carbonization of the substance may be characterized as a two-dimensional crystallization; the final stage of the latter is the formation of the anthracite structure. The transition to the three-dimensional lattice of graphite occurs abruptly. Formation of two-dimensional crystals is characteristic only for caustic bioliths of the humus series; the beginning of the formation of the nuclei of the crystalline lattice must be considered the beginning of carbonization. X-ray structural analysis of oriented specimens has shown that two-dimensional crystalline lattices are located along the plane of stratification. When coal dust is subjected to high pressure, the crystalline lattices of two-dimensional crystals take up a specific orientation after several minutes. The anisotropy which develops differs in various coals. Coal magnified 50 000 times under electron microscope appears as a spongy mass with small round pores. Orientation of the two-

Card 2/3

KASATOCHKIN, V. I.

Category: USSR / Physical Chemistry - Crystals

B-5

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 29789

Author : Kasatochkin V. I., Razumova L. L.

Inst : Academy of Sciences USSR

Title : X-Ray Analysis of Molecular Structure of Coal and Coke

Orig Pub: Izv. AN SSSR. Ser. fiz., 1956, 20, No 7, 751-754

Abstract: On the basis of the concepts of macromolecular structure of carbonaceous matter of coal and coke, the interference function of x-ray scattering is expressed depending upon probability of orderly packing of W network of the C atoms which constitute the scattering units. Widening of the 002 interference band on the roentgenograms, taken as index of inter-reticular orderliness, is determined by magnitude of W, dimension of coherent volumes. The $4\pi r^2 \Delta S$ curves of coke, obtained as a result of integral analysis of intensity curves, are interpreted as the result of superposition of $4\pi r^2 \Delta S$ functions of the different structural forms of C in coke -- of carbon networks and chains. The difference in $4\pi r^2 \Delta S$ curves

Card : 1/2

-57-

Card : 2/2

-58-

KAZATOCHKIN, V.I.; YUROVSKIY, A.Z.; SHUBNIKOV, A.X.

To P.F.Andreev's review of the book of S.M.Grigor'ev "Formation
processes and properties of mineral fuels." Zhur.prikl.khim.29
no.2:315-317 P '56. (MIRA 9:6)
(Coal) (Petroleum) (Grigor'ev, S.M.) (Andreev, P.F.)

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000721010008-2

KASATCHKIN, V. I.

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000721010008-2"

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000721010008-2

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000721010008-2"

KASATOKHIN, V.I.

PRIKHOT'KO, A.F.

24(7)

3

PHASE I BOOK EXPLOITATION 207/1365

L'vov. Universitet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizichnyy zbirnyk, vtp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Jazer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Laviatberg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Pablinitskiy, I.L., Doctor of Physical and Mathematical Sciences, Pablikant, V.A., Doctor of Physical and Mathematical Sciences, Kornitskiy, V.O., Candidate of Technical Sciences, Rayskiy, S.N., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S., A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Dugay, P.M. Spectrophotometric Study of the Mechanism and Kinetics of the Interaction of Concentrated Sulfuric Acid With Diphenyl Amines and With Some of its Derivatives

245

Tagirov, R.B. Infrared Emission Spectra of Certain Flames and Combustion-zone Products

252

Kumetsova, N.P. Some Spectral Studies in the Field of the History of Geochemistry and in the Genetic Classification of Bitumens

255

Zil'berbrand, O.I., and V.I. Kasatokhin. Use of Infrared Spectroscopy in the Study of the Chemical Structure of Shale Kerogen

257

Kasatokhin, V.I., O.I. Zil'berbrand, and A.A. Shubin. Infrared Absorption Spectra of Organic Mineral Substances

261

Card 17/30

KASATOCHKIN, V.I.

ABRAMOV, S.K., kand.tekhn.nauk; AVERSHIN, S.G., prof., doktor tekhn.nauk;
AMMOSEV, I.I., doktor geol.-min.nauk; ANDRIYEVSKIY, V.D., inzh.;
AMEROPOV, A.N., inzh.; APANAS'YEV, B.L., inzh.; BERGMAN, Ya.V.,
inzh.; BLOKHA, Ye.Ye., inzh.; BOGACHEVA, Ye.N., inzh.; BUKRINSKIY, V.A.,
kand.tekhn.nauk; VASIL'YEV, P.V., doktor geol.-min.nauk; VINOGRADOV,
B.G., inzh.; GOLUBEV, S.A., inzh.; GORDIYENKO, P.D., inzh.; GUSEV, N.A.,
kand.tekhn.nauk; DOROKHIN, I.V., kand.geol.-min.nauk; KALMYKOV, G.S.,
inzh.; KASATOCHKIN, V.I., doktor khim.nauk; KOROLEV, I.V., inzh.;
KOSTLIVTSEV, A.A., inzh.; KRATKOVSKIY, L.F., inzh.; KRASHCHENNIKOV, G.F.,
prof. doktor geol.-min.nauk; KRIKUNOV, L.A., inzh.; LEVIT, D.Ye., inzh.;
LISITSA, I.G., kand.tekhn.nauk; LUSHNIKOV, V.A., inzh.; MATVEYEV, A.K.,
dots., kand.geol.-min.nauk; MEPUKISHVILI, G.Ye., inzh.; MIRONOV, K.V.,
inzh.; MOLCHANOV, I.I., inzh.; NAUMOVA, S.N., starshiy nauchnyy sotrudnik;
NEKIPPELOV, V.Ye., inzh.; PAVLOV, F.F., doktor tekhn.nauk; PANYUKOV, P.N.,
doktor geol.-min.nauk; POPOV, V.S., inzh.; PYATLIN, M.P., kand.tekhn.
nauk; RASHKOVSKIY, Ya.L., inzh.; ROMANOV, V.A., prof., doktor tekhn.
nauk; RYZHOV, P.A., prof., doktor tekhn.nauk; SEL'YATITSKIY, G.A., inzh.;
SPERANSKIY, M.A., inzh.; TEREHT'YEV, Ye.V., inzh.; TITOV, N.G., doktor
khim.nauk; GOKAREV, I.F., inzh.; TROYANSKIY, S.V., prof., doktor geol.-
min.nauk; FEDOROV, B.D., dots., kand.tekhn.nauk; FEDOROV, V.S., inzh.
[deceased]; KHEMENTOVSKIY, A.S., prof., doktor geol.-min.nauk; TROYANOV-
SKIY, S.V., otvetstvennyy red.; TERPIGOREV, A.M., red.; KRIKUNOV, L.A.,
red.; KUZNETSOV, I.A., red.; MIRONOV, K.V., red.; AVERSHIN, S.G., red.;
BURTSEV, M.F., red.; VASIL'YEV, P.V., red.; MOLCHANOV, I.I., red.;
RYZHOV, P.A., red.; BALANDIN, V.V., inzh., red.; BLOKH, I.M., kand.
tekhn.nauk, red.; BUKRINSKIY, V.A., kand.tekhn.nauk, red.; VOLKOV, K.Yu.,
inzh., red.; VOBO'YEV, A.A., inzh., red.; ZVONAREV, K.A., prof. doktor
tekhn.nauk, red. (Continued on next card)

ABRAMOV, S.K.--- (continued) Card 2.

ZDANOVICH, V.G., prof., doktor tekhn.nauk, red.; IVANOV, G.A., doktor geol.-min.nauk, red.; KARAVAYEV, M.M., red.; KOROTKOV, G.V., kand.geol.-min.nauk, red.; KOROTKOV, M.V., kand.tekhn.nauk, red.; MAKKAVEYEV, A.A., doktor geol.-min.nauk, red.; OMEL'CHENKO, A.N., kand.tekhn.nauk, red.; SENDERZON, E.M., kand.geol.-min.nauk, red.; USHAKOV, I.N., dots., kand.tekhn.nauk, red.; YABLOKOV, V.S., kand.geol.-min.nauk, red.; KOROLEVA, T.I., red.izd-va; KASHALKINA, E.I., red.izd-va; PROZOROVSKAYA, F.L., tekhn.red.; NADEINSKAYA, A.A., tekhn.red.

[Mining; an encyclopedia handbook] Gornoe delo; entsiklopedicheski apravochnik. Glav. red. A.M.Terpigorev. Moskva, Gos.nauchno-tekhn. izd-vo lit-ry po ugol'noi promyshl. Vol.2. [Geology of coal deposits and surveying] Geologiya ugol'nykh mestorozhdenii i marksheiderskoe delo. Redkolegiia tova S.V.Troianskiy. 1957. 646 p. (MIRA 11:5)

1. Chlen-korrespondent AN SSSR (for Karavayev)
(Coal geology--Dictionaries)

ZIL'BERBRAND, O.I.; KASATOCHEN, V.I.

Use of infrared spectroscopy in studying the chemical structure
of kerogen in shale. Fiz. sbor. no. 3:257-261 '57. (MIRA 11:8)

1. Institut goryuchikh iskopayemykh AN SSSR.
(Kerogen--Spectra) (Chemical structure)

1. 0.000000, 0.000000.

Kasatochkin, V.I.

68-6-7/19

AUTHOR: Zamoluyev, V.K., Candidate of Technical Sciences, and
Kasatochkin, V.I., Doctor of Chemical Sciences.

TITLE: Changes of the Coefficient of Temperature Conductivity of
Coals during Isothermal Decomposition. (Izmeneniye koeff-
itsiyenta temperaturoprovodnosti kamennykh ugley pri izo-
termicheskom razlozhenii)

PERIODICAL: Koks i Khimiya, 1957, No.6, pp. 21 - 23 (USSR)

ABSTRACT: A study of temperature conductivity of Donets coals of
the Δ , K and Π C types at various stages of isothermal decom-
position at various temperatures (400, 500 and 700 °C) was
carried out. Vitre component of the above coals separated
in heavy liquids (properties Table 1) was taken for the inve-
stigation. The experimental results are given in Table 2 and
a diagram. It is concluded that changes in the coefficient
of temperature conductivity depend on the type of coal, temp-
erature and time of decomposition under isothermal conditions.
For coal types K and Π C, a sharp decrease of the coefficient
is observed during the transition of coal into the plastic
state. Time of the transition of various coals into the
plastic state is different; therefore, there is a possibility
of increasing the coefficient of temperature conductivity of
Card 1/2 coal blends by a suitable choice of their components.

68-6-7/19

Changes of the Coefficient of Temperature Conductivity of
Coals during Isothermal Decomposition.

There are 2 tables, 1 figure and 7 Slavic references.

ASSOCIATION: Institute of Mineral Fuels of the Academy of Sciences
of the USSR. (Institut Goryuchikh Uskopgemykh AN SSSR)

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Card 2/2

USSR / Soil Science. Biology of Soils.

J-3

Abs Jour : Ref. Zhur - Biologiya, No 17, 1958, No. 77400

Author : Lapina, N. K.; Kasatochkin, V. I.

Inst : Institute of Fuel Reserves AS USSR

Title : Ion Exchange and the Structure of Humic Acids

Orig Pub : Pochvovedeniye, 1957, No 9, 28-32

Abstract : Investigation of the IE absorption spectra of humic acids and humates of Na, Ca and Ba that were separated from different coals confirmed the molecular mechanism of ion exchange in the alkaline solutions of humates. Alkaline humates are genuine molecular solutions which consist of individual aromatic lattices with lateral radicals which carry carboxylic groups in ion form. With the formation of Ba- or Ca-humates, an exchange reaction with Na or H takes place; the formation is possible of complexes of two and more molecules of humic acids connected through a cation:

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KASATOCHKIN, V. I.

24-11-31/31

AUTHORS: Zamoluyev, V. K. and Kasatochkin, V.I. (Moscow)

TITLE: Coefficient of temperature conductivity of hard coal at various stages of isothermal decomposition. (Koeffitsiyent temperaturoprovodnosti kamennykh ugley na raznykh stadiyakh izotermicheskogo razlozheniya).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1957, No.11, pp. 199-200 (USSR)

ABSTRACT: Results are described of the study of changes in the coefficient of temperature conductivity of five grades of Donets coal, the data of which are given in a Table, as a function of the degree of isothermal decomposition at various temperatures. The tests were carried out with coal after decomposition in heavy liquids. The isothermal decomposition of the coal was effected in a quartz tubular furnace inside a stream of purified nitrogen at the temperatures 400, 500 and 700°C. After various heating times in the furnace, the coefficient of temperature conductivity was determined at 20 to 40°C according to the method of the regular thermal regime proposed by G. M. Kondratev and the author of this paper and perfected for investigating relatively small samples Card 1/2(Refs.1,2). The results are given in the form of a

KASATOCHKIN, V.I.

20-6-36/59

AUTHOR:
TITLE:

KASATOCHKIN, V.I., SMUTKINA, Z.S.
Thermal Decomposition Kinetics and Structure Transformations of
Fossil Coals. (Kinetika termicheskogo razlozheniya i strukturnyye
prevrashcheniya iskopayemykh ugley, Russian)

PERIODICAL:

Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 6, pp 1314-1317
(U.S.S.R.)

ABSTRACT:

The thermal decomposition of fossil coals shows a series of character-
istic features which can be brought into connexion with the chemical
structure of their organic substance. The coal substance combines
in its structure a relatively inactive core (carbon nets) with a
reactive, peripheric part (lateral radical). By this the usually
observed two stages of the primary and secondary decomposition,
which differ considerably from each other, can be explained. In the
case of the first, which develops comparatively quickly at a low
temperature, the main mass of the volatile substances is separated
chiefly by the destruction of the lateral radical. Chemical modi-
fications of the core of the structure begin at a later stage of the
secondary decomposition. Thus, the carbon nets of the initial coal
substance remain in the solid product (coke). They form centers
of a bidimensional carbon crystallization in the process of carbon-
ization of the organic coal substance. Structural transformations
of the coal substance were investigated by means of radiographic

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APPROVED FOR RELEASE: 06/13/2000

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process of secondary decomposition of the coal and on temperature.
depends on the metamorphism stage of the coal and on temperature.
The observed rapid rise of activation energy in dependence on a
for low decomposition temperatures might be assumed to be con-
nected with the selectivity of the process of the primary destruc-
tion of the lateral radical. Radiographic investigation of the
structural transformations of the coal substance during thermal
decomposition was carried out in a series of solid residues of the
coke coal which originated from the aforementioned experiments.
The observed changes are connected with the primary decomposition
of the lateral radical and elimination of structural units. The

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having obtained mobility they endeavor, on the occasion of trans-
ition to the liquid-flowing state, to reach a position parallel
to each other under the influence of the molecular field of forces.
The infrared absorption spectra of the solid residues characterize
essential modifications in the atomic groupings of the coal sub-
stance. The regular modifications of the position and of the
intensity of the absorption strips according to the grade of de-
composition indicate a relatively lower thermal stability of the
aromatic simple ethers compared to the aliphatic and cyclical
simple ethers. (3 illustrations, 4 Slavic references)

ASSOCIATION: Institute for Combustible Fossil Substances of the Academy of
Science of the U.S.S.R.

PRESENTED BY: V.A.KARGIN, Member of the Academy

SUBMITTED: 21.11.1956

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Card 3/3

KASATOCHKIN, V.I.

AUTHOR
TITLE

PERIODICAL

ABSTRACT

KASATOCHKIN, V.I., LARINA, N.K.

The Investigation of the Structure of Humine Acids of Fossil Coals.
(Issledovaniye stroyeniya guminovykh kislot iskopayemykh ugley - Russian)
Doklady Akademii Nauk SSSR, 1957, Vol 114, Nr 1, pp 139-142 (U.S.S.R.)

20-1-38/64

The investigation of the structure and the properties of humine acids is of importance in connection with obtaining further knowledge concerning the chemical structure of fossil coals. The experimental material mentioned in this paper confirms the previously formed opinion: The structure of the molecules of humine acids occurs in form of individual flat aromatic nets of carbon with side radicals, containing various oxide and other functional groups. In connection herewith it can be said that the acid process occurring on this occasion is a process of acid-producing destruction of the macromolecules with separation of individual structural units. A precise definition of the structural scheme (as a chemical structural formula) can not yet be given because the carbon nets as molecule cores are characterized by a certain distribution (according to size) and the functional groups are distributed among the molecules. - The importance of the structure of humine acids etc. is of interest because the skeleton of the molecules in the carbon of humine acids corresponds to that of the carbon skeleton of the structural units of the carbonic matter.
(2 tables and 3 diagrams).

A:
F:
SL
AV
Ca

Card 1/2

AUTHORS: Kasatochkin, V. I., and Kaverov, A. T. 20-117-5-31/54.

TITLE: The Kinetics and the Mechanism of the Homogeneous Graphitization of Carbon (Kinetika i mekhanizm gomogennoy grafitatsii ugleroda).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 117, Nr 5, pp. 837-840 (USSR).

ABSTRACT: The present paper furnishes the results of the X-ray investigation of the kinetics and of the mechanism of the graphitization of cracking pyrolytic petroleum coke subject to isothermal conditions at temperatures of 2000, 2150, 2420 and 2800°C. The graphitization took place in a furnace with a graphite heater in an atmosphere of nitrogen and argon. According to the duration of the isothermal treatment in the furnace (hkl) bands appear in the roentgenographs, the intensity and acuteness of which increases with an increasing duration of the treatment. At the same time, the half width of the (hkl) bands and of the (00k) bands decreases. These modifications of the roentgenographs indicate an azimuthal orientation of the packets of the parallel basic lattices together with the occurrence and a further perfection of the three-dimensional orderliness of the carbon. Besides, a decrease of the distance d_{002} between the planes in accordance with theoretical principles is observed, which is also connected with the azimuthal orientation of the carbon layers to-

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KASATOCHKIN, V. I.

AUTHORS: Zil'berbrandt, O.I., Kazakov, Ye. I., ^{24-2-25/28}Kasatochkin, V.I.
and Tyazhelova, A.A. (Moscow).

TITLE: Investigation of the composition and of the properties
of bitumen from shale tars of the Volga area.
(Issledovaniye sostava i svoystv bituma iz degtey
privolzhskikh slantsev).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh
Nauk, 1958, No.2, pp. 155-158 (USSR).

ABSTRACT: The results are described of investigation of bitumen
obtained by oxidation of heavy fractions of semi-coking
tars of Kashiria shale under works conditions. The
residual tar fraction, boiling at 320°C, was subjected to
oxidation in air at 170 to 180°C. Depending on the
duration of the oxidation, various bitumen grades were
obtained, the characteristics of which are entered in
Table 1, p.156. It is concluded that with increasing
duration of the oxidation of the original raw materials
an accumulation takes place of hydrogenated and of the
condensed asphaltene structures; the quantity is reduced
of oils which, in the given case, become more saturated,
compensating approximately the constancy of the relative

Card 1/2 contents of carbon and of hydrogen.

24-2-25/28

Investigation of the composition and of the properties of bitumen
from shale tars of the Volga area.

There are 3 figures, 2 tables and 15 references -
9 Russian, 6 English.

SUBMITTED: November 9, 1956.

AVAILABLE: Library of Congress.

Card 2/2

62-58-6-4/21

AUTHORS: Zamoluyev, V. K., Candidate of Technical Sciences,
Mazankina, K. T., Candidate of Chemical Science and
Kasatochkin, V. I., Doctor of Chemical Science

TITLE: The Dependence of the Coefficient of Thermoconductivity on the
Degree of Interlattice Order of Coals During Isothermal
Decomposition (Zavisimost' koeffitsiyenta
temperaturoprovodnosti ot mezhsetochnoy uporyadochennosti
kamennykh ugley pri izotermicheskom razlozhenii)

PERIODICAL: Koks i Khimiya, 1958, Nr 6, pp 11-13 (USSR)

ABSTRACT: The coefficient of thermoconductivity and the degree of inter-
lattice order of the Donets coal of G (gas) and K (coking)
types under conditions of isothermal decomposition at
500 and 700°C were investigated. The determination of the
thermoconductivity coefficient of specimens obtained after
various heating times in a furnace was carried out at
20-40°C using the method of regular heating conditions
(Refs.4,5). The agreement between parallel determinations
was within 1%. Powder X-ray photographs of the same
specimens were also carried out using filtered copper
radiation. The experimental results are shown graphically
in Figs. 1 and 2 for G and K coals respectively. It was

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63-58-6-4/21

The Dependence of the Coefficient of Thermoconductivity on the Degree of Interlattice Order of Coals During Isothermal Decomposition

established that in the initial stages of isothermal decomposition of coals, the thermoconductivity coefficient substantially decreases and the degree of inter-lattice order sharply increases. Changes in the thermoconductivity coefficient and the degree of inter-lattice order of coals during the process of isothermal decomposition are determined by a rearrangement of steric bonds in the coal substance.

There are 2 figures, 1 table and 6 references, all of which are Soviet.

ASSOCIATION: IGI AN SSSR

1. Coal--Decomposition 2. Coal--Thermochemistry

Card 2/2

20-119-4-44/60

AUTHORS: Kasatochkin, V. I., Kononova, M. M., Zil'berbrand, O. I.

TITLE: Infra-Red Absorption Spectra of Humus Substances of the Soil (Infrakrasnyye spektry pogloshcheniya gumusovykh veshchestv pochvy)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 4, pp. 785 - 788 (USSR)

ABSTRACT: The humus substances are the most characteristic compounds of the organic part of the soil. They were often investigated. Since, however, many problems connected with them are complicated and the nature of the substances varies according to the conditions of the soil formation, a number of problems concerning their nature and structure is not explained. In the present paper results are given of a comparative investigation of the structure of the humic-and "fulvic" acids, as in the title, and by means of radiographic method. As samples served: common black soil and lawn bleaching earth, both different to a great extent from each other. The method of

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20-119-4-44/60

Infra -Red Absorption Spectra of Humus Substances of the Soil

isolation of the humus substances was already described (Reference 1). Table 1 gives the elementary composition of the humus substances. These data show a higher degree of carbon enrichment in humic acids from black soil compared to those from the lawn "bleaching" earth and especially with the fulvic acids. Figure 1 shows schematically the interference bands on radiographs as rectangles the altitude of which corresponds to the relative intensity, and their width to the half width of the bands. The carbon skeleton of the molecules of the humic- and "fulvic" acids is characterized by the existence of an aromatic carbon atomic net (nuclear part) and of lateral groups (peripheric part) of non-aromatic nature, the latter contain carbon, sulfur, nitrogen, and other elements. In the molecules of humic acids the nuclear part is, in comparison with "fulvic" acids, better marked. This corresponds to a higher carbon percentage which is organized into carbon lattices. In humic acid from lawn bleaching earth the net is marked to a smaller extent than in the case of black soil. The existence of the peripheric

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Infra-Red Absorption Spectra of Humus Substances of the Soil

part which is marked to a smaller extent is characteristic of "fulvic" acid molecules. The obtained results prove uniform structure principles of humic- and "fulvic" acids from common black soil as well as from the lawn bleaching earth. However, besides the relation between the nuclear- and the peripheric part of the molecular structure, also the structure of the lateral groups in humic- and "fulvic" acids varies. There are 2 figures, 1 table and 3 Soviet references.

ASSOCIATION: Pochvennyy institut im. V. V. Dokuchayeva Akademii nauk SSSR
(Soil Institute imeni V. V. Dokuchayev AS USSR)

PRESENTED: October 4, 1957, by I. V. Tyurin, Member, Academy of Sciences, USSR

SUBMITTED: September 28, 1957

Card 3/3

AUTHORS: Kasatochkin, V. I., Kaverov, A. T. 674/20-120-5-21/67

TITLE: The Electric Properties and Structure of the Transitional Forms of Carbon (Elektricheskiye svoystva i struktura perekhodnykh form ugleroda)

PERIODICAL: Doklady Akademii nauk SSSR, 1974, Vol. 120, No. 5, pp.1007-1010 (USSR)

ABSTRACT: In this paper the results of an experimental investigation of the thermo e.m.f., of the electric resistance and of the structure of transitional forms from "amorphous carbon" to graphite are given. These forms are produced by a high-temperature treatment of different carbon samples. A homogeneous transition from the "amorphous carbon" to graphite was observed in petroleum cokes, in mineral coals and in a few other carbon samples at temperatures of 1000 - 2600°. The nature of this process is essentially a successive azimuthal orientation of the parallel layers formed in the thermal destruction of lateral carbon chains. Numerical data concerning the reduction of the distance between the layers are given. The samples were produced by an isothermal annealing for dif-

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NOV 26-1967-5-21/67

The Electric Potential and Structure of the Transitional Forms of Carbon

ferent periods of petroleum cokes in a furnace in a nitrogen current at different temperatures. The positive sign of the coefficient α of the thermo e.m.f. confirms the semiconductor properties and the hole mechanism of electric conduction in the soot samples within the entire temperature interval, whereas in petroleum cokes this temperature range is limited by 1600 and 2800°. At $t > 2800^\circ$ and the specific electric resistance ρ decreases as the distance between the layers in the homogeneous graphitization of coke. Some numerical data are given. Relations of the type $\gamma = a - b \lg \sigma$ and $\sigma = A/\rho - B$ exist between α and the specific electric conductivity. The change of α in the pre-crystallization stage can be explained by the following two processes in the thermal treatment: 1) A growth of the carbon layers and 2) A destruction of the lateral carbon chains. There are 4 figures, 1 table, and 8 references, 4 of which are Soviet.

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